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GEOGRAPHICAL RECORD

NORTH AMERICA

Reindeer Experiments in Canada. The preliminary success of Dr. Wilfred Grenfell's reindeer experiments have already been noted in scientific journals. The *Canadian Forestry Journal* now reports (Vol. 12, 1916, pp. 481-482) on the value of a part of the original herd in browsing off hardwood seedlings on evergreen plantations in Quebec. They devour the hardwoods and do not touch the conifers and thus succeed where other methods have failed. On the other hand, the attempt to "colonize" the Mackenzie River country at Fort Smith by sending thither a part of the Newfoundland herd has ended in failure. Forty reindeer were placed in a reserved area and left to themselves, but up to a year ago only three were alive. Further experiment is needed, however. The Canadian Northwest has immense reserves of suitable forage for reindeer, and the success of the Alaska experiment is too great to fail to impress the pioneer people of the lower Mackenzie.

The Forest Regions of Central British Columbia. Central British Columbia—that part of the province lying roughly between the 51st and 57th parallels—is a region of great though still undeveloped timber resources (The Forests of Central British Columbia, by H. R. Christie, *Forestry Quart.*, Vol. 13, 1915, No. 4). Nearly 80 per cent, or 80,000,000 acres, is forested, and of this the major portion, about 70,000,000 acres, represents ultimate forest land or land that in addition to its forest products can be utilized only for summer grazing. Exploitation is comparatively small as yet. It gives occupation to a majority of the wage earners, but the population is only one to every ten square miles. It is estimated that complete use of the present timber would bring the province \$2,000,000 per annum in royalties alone, while under proper management the yield could be doubled.

Of the six main types of forest the most valuable are those lying to the east and north of the Interior Plateau. The "interior wet belt" of the Gold, Cariboo, Selkirk, and Rocky Mountains, with warm summers and a yearly precipitation of 30 to 40 inches, has a rich and varied forest distinguished by rapid growth and large yield. Cedar, hemlock, Engelmann spruce, Douglas fir, lodgepole pine, Alpine fir, and white pine are the chief species. About 75 per cent of the area has been burned over in the last half century, but the second growth is of good quality. Northward, the Upper Fraser basin constitutes another region of great possibilities. In temperature and precipitation and arboreal type it is an intermediate between the "interior wet belt" and the "northern forest." It comprises under a fifth of the forested area, somewhat less than the northern forest. The latter occupies the upper basins and headwaters of the Skeena and Peace Rivers. Precipitation, chiefly in the form of snow, amounts to about 20 inches; summer frosts are common, and the forest approaches the sub-alpine type; it is dense and slow-growing. Engelmann spruce and Alpine fir are the dominant species. The forest will be a producer of spruce lumber and pulp. The Interior Plateau, with a part of the western slope of the Rockies south of Yellowhead Pass, accounts for a quarter of the forested area. The small rainfall—10 to 20 inches—is not favorable to good forest growth. Trees are small, and, beyond local use, pulp will be the only considerable product. Unfortunately much of the Douglas fir has been lost by fire and replaced by the less valuable lodgepole pine, the principal species, and poplar. In the deep valleys of the plateau, with hot summers and limited rainfall, grass competes successfully with trees. The parklike forests of the Fraser and North Thompson Rivers are characterized by yellow pine, useful for local needs only. The remaining quarter of the area, the islands and the western slopes of the Coast Range, is covered by the "north coast forest." Abundant precipitation and equable climate are offset by steep slopes and lack of mineral soil. Tree growth is small, and good stands of saw timber of rather local occurrence. This feature, in combination with the wonderful water-power resources, should encourage a development of the pulp industry. Western hemlock, with red cedar and some yellow cedar, and Sitka spruce, are the distinguishing species.

Canadian Trade in 1915. Very significant is Canada's changed standing in foreign trade; thanks largely to the war she has now become a creditor nation. Whereas 1914 showed an adverse balance of \$50,000,000 in the import and export of merchandise,

1915 showed a favorable balance of over \$240,000,000, gained chiefly by an export increase of nearly 50 per cent (Canada, *Suppl. to Commerce Repts.*, Ann. Series, No. 23a, Washington, 1916). The most distinctive feature of Canadian prosperity in 1915 was the bumper wheat crop of the Northwest Provinces, which is estimated at about 343,000,000 bushels as compared with a little short of 141,000,000 bushels in 1914. Oats and barley show like increases (Canada: Prairie Provinces, *Suppl. to Commerce Repts.*, Ann. Series, No. 23c, Washington, 1916).

Geographic Controls in the Development of Minnesota. In the February number of the *Journal of Geography* is a group of striking essays on the geographic development of Minnesota. One of these, by C. J. Posey, deals with the "Geographic Influences in the Exploration and Early Development of Minnesota." The white man's entry into the state was controlled by the hydrography. The country is a glaciated plain at the head of three drainage systems, the Mississippi, the St. Lawrence, and the Red River, which afford easy access to it. Thus, in spite of its interior position, the territory was entered at an early date. The first authenticated entrance was that of Sieur Duluth in 1679, though it is not improbable that Radisson and Groseilliers were within the boundaries of the present state twenty-four years earlier. The French voyageurs came for furs, the article that formed Minnesota's principal production until 1850. The fur industry, leading to the establishment of trading posts on the main routes, attained its zenith in 1843, when the Hudson Bay Company installed the line of Red River carts connecting St. Paul with Winnipeg. Even today St. Paul remains the primary fur market of the United States, though the Government market for Alaskan furs has recently been instituted in St. Louis.

Unfortunately the water highways are closed to commerce for five months of the year; hence, until the coming of the railroad and the telegraph, Minnesota suffered much from winter isolation. Old newspaper records recounting the way in which the mail was carried by dog train over the ice are reminiscent of present-day methods in Alaska. The first permanent settlements were commonly located about the falls on the rivers where a break in transportation was necessary and where sources of power later led to the creation of urban centers. The establishments below the falls of St. Croix and St. Anthony are early and well-known examples.

The forests constitute the next control of importance. They were, it is true, an impediment to travel—many of the roads made long detours to keep to the prairie—but the disadvantage was far outweighed by the value of the forestal resources. As the output of eastern woods began to diminish the woodsmen turned westward. The pioneers of lumbering in Minnesota came from Maine. By 1850 the lumbering had surpassed the fur industry.

The succeeding decade was remarkable for the development of agriculture. Of the three assignable causes, two—the introduction of labor-saving machinery and railroad building—were common to other sections of the country. The third, the discovery of a new milling process, was peculiar to the spring-wheat area of the Northwest. Its improvement of the grade of flour obtainable from this variety of wheat immediately put a new value on the Minnesota grain and laid the foundation of the state's prosperity (The Wealth of Minnesota, by E. V. Robinson, *Journ. of Geogr.*, *ibid.*). During this decade of agricultural expansion the population increased by 2,730 per cent, a phenomenal figure unrivaled by any other state.

Mineral wealth was the last great resource to be developed. Exploitation of the vast iron ore deposits of the Ranges did not commence until 1884, but, once started, the mushroom towns of the Ranges sprang up quickly enough (Minnesota Cities: Duluth and the Range Towns, by Eugene Van Cleef, *Journ. of Geogr.*, *ibid.*). Hibbing (Mesabi), founded in 1892, now has a population of 12,000. Duluth, the greatest product of the mining industry, with 5,000 people in 1880, is today accredited with 85,000. (Cf. also "Population Controls in Montana" in the *March Review*, p. 217.)

Seismic Activity in California During 1915. To the student of earthquakes California is by far the most interesting state in the Union. Records for last year collected from 179 stations show a total of 83 shocks, a number exceeding that for the remainder of the states combined (California Earthquakes During 1915, by Andrew H. Palmer, *Bull. Seismolog. Soc. of America.*, Vol. 6, 1916, No. 1). The earthquakes appear to have been purely tectonic in character. Analysis of the major shocks shows deep-seated foci, with comparatively long duration of time between preliminary and maximum vibrations and widespread occurrence. Not a single earthquake occurred contemporaneously with an eruption of Mount Lassen. The year afforded a good test of relations between volcanic action and earthquakes, for the volcano maintained a state of unusual activity. Shocks were more severe and numerous in the south of the state, the worst recorded,

that of June 22, involving destruction of life and property. With the exception of the Imperial Valley more shocks were registered on the coast than in the interior, a phenomenon probably explainable as a resultant of recent and progressive uplift along the eastern scarp of the southern Sierra Nevada. San Francisco, in a zone of heavy faulting and apparently at the crossing point of opposed stress planes, is associated with high seismicity. Lone Pine, Owens Valley, formerly a notorious seismic center, only experienced a single shock during the year. The increased seismicity in the Imperial Valley, and in Pleasant Valley, Nevada, suggests that migration has taken place along a fault line.

The Carnegie Institution's Investigations in the Salton and Mohave Desert Regions. Brief accounts of the research work carried on in these desert regions under the auspices of the Carnegie Institution of Washington are contained in its *Year Book for 1915* (p. 90-97). Weekly gage-readings of the level of water in the Salton Sea gave a total recession of about 50 inches for the year ending July 1, 1915. Data on the composition and rate of concentration of the chemical constituents were obtained. Material was also gathered on the history of Blake Sea, the ancient precursor of Salton Sea, which promises to be of importance in determining the climatic cycles and the geological succession of plants in the Mohave Desert region. A general reconnaissance of the vegetistic features of this area was made in the autumn of 1914 and the spring of 1915 by Forrest Shreve. This investigation confirmed former results on the slight amount of habital differentiation exhibited by the native plants.

Ellsworth Huntington's studies of climatic changes were continued in the principal basins of the Mohave Desert. Possible evidences of climatic changes found in the terraces and alluvial deposits of the *bajada*, or *débris-apron*, type by this investigator and E. E. Free afford a new aid in the correct interpretation of these physiographic elements. In the course of these studies Huntington also considered the relation of playas to climatic changes. The stages of their development contribute valuable clues. Death Valley and the area draining into it is an inviting field for these climatic researches. The final correlation undertaken of the diverse types of evidence, botanical, chemical, and physiographic, reveals a close degree of correspondence. A comparison, for example, of the curve of the growth of the sequoia tree and the old strands in Owens Lake shows that periods of high water in the lake corresponded with periods of rapid growth in the trees.

Migrations of Animal Life Over the Isthmus of Panama. Intermigration of animals between the northern and southern continents of America was the subject of a lecture delivered in August, 1915, by Professor W. B. Scott at the San Francisco meeting of the American Association for the Advancement of Science. The lecture is published in *Science* for January 28, 1916 (pp. 113-124).

The zoological relations between North and South America were dominated principally by the geography, past or present, of the Isthmus of Panama. Differences in the faunas of the two regions point to extensive geological changes. Periods of land connection and of absolute separation succeeded each other. In the former case likeness of species would be established. In the latter a complete dissimilarity of animals would result. Climate also played its part, as the migrations took place only under favorable climatic conditions. They reached their culmination in the Pleistocene, when mammals common to the two continents appear in greater variety than at any other period. The number of South American types found in North America is small. The list practically does not comprise more than opossums, a few rodents, ground-sloths, and glyptodonts. In contrast to this the range of northern forms present in South America is extensive. These include—to mention only a few—bears, cats, otters, rabbits, mice, horses, llamas, and deer.

Professor Scott attributes this predominance of northern animals over southern to the higher stage of intelligence and of structural development attained by them. He refrains, however, from pointing to the heliotropic instinct present in many forms of life and which compels a search for warmer climates because of the greater ease with which sustenance is derived in lands of sunshine. The southern forms had no equivalent inducement to press northward.

In the Oligocene epoch a broad sea intervened between North and South America. The date of the reappearance of land cannot yet be determined with precision; it probably took place at the close of the Oligocene. The ground-sloth in the middle Miocene beds of Oregon proves that connection had been re-established in the early Miocene. The isthmian region appears to have been broader in the Pliocene, although the isthmus was depressed once more beyond its present limits at some time during the Pleistocene.

The separation of South American mammals into two radically different groups is an evidence of migration. One of the assemblages is autochthonous, the other immigrant. Highly characteristic edentates and a large number of peculiar rodents take rank in the first group. The foreign arrivals consist of beasts of prey and hoofed animals. On the northern continent the southern forms represent remnants of early immigration which could not take deep root on account of climatic obstacles. Central America and the West Indies belong zoologically to South America. Professor Scott's lecture throws into relief the significant part played by the geographical history of the Isthmus of Panama.

EUROPE

Strategic Features of the Baltic Basin. From the strategic point of view the topography and hydrography of the Baltic Basin present several features of interest (Charles Rabot: *La Baltique*, *La Nature*, Jan. 1, 1916; *Les détroits Danois*, *ibid.*, Feb. 26, 1916). The slight salinity of the Baltic waters in contrast with those of the open ocean involves flotation problems both for surface and submarine craft. At the entrance to the sea vessels from the ocean must for each thousand tons' displacement lighten by thirty tons to maintain the normal water line. This circumstance, combined with the frequency of shallows, renders navigation a delicate matter for the smaller submarine with a limited degree of floatability. Some compensation, however, arises from the opacity of the waters, fed to so great a degree from the land. Recent physiographic development creating a fiord type of coast along the north and west has produced features favoring defense and navigation. Behind the outer island wall lies an interior line of communications. Vessels of considerable draft can go from Åland to Kronstadt without passing into the open sea. The similar Swedish line from the extremity of the Gulf of Bothnia to the southern end of the Strait of Kalmar has proved of great service to the German ships carrying ore from northern Sweden to Stettin and Lübeck. Its importance may be gaged by the magnitude attained by the trade—during the first nine months of 1915 no less than 2,000,000 tons of ore were shipped to Germany—and the growth of the port of shipment, Luleå.

The strategic interest of the Baltic concentrates in the "defile" of its entrance. The salient features of the Baltic straits are their narrowness and shallowness. They also offer impediments to navigation in their complex and variable currents. The surficial outward-moving current of fresh water, often of slight depth, is susceptible to rapid change in direction with changing winds. Where the water is shallow local eddies are not infrequently caused. Shallowness is the greatest impediment in the Sound. The decline of this most direct route is due in part to the growth of modern vessels as well as to the construction of the Kiel Canal. The Little Belt is deeper but the route longer and its southwestern shore is German territory. The Great Belt, still deeper and more commodious, has been carefully mined. Since the development of the railroad ferry service, the straits may be considered as a land no less than a water defile. By the four lines operating in the straits and the fifth connecting southern Sweden with the German mainland via Rügen transportation proceeds from Scandinavia to Germany without a break. From the beginning of the war, with a slight interruption during the winter of 1914-15, activity along these routes has been unparalleled, for the defile not only concentrates lines of traffic and serves as a depot of supplies but itself lies in a zone of great industrial activity.

Geographical Conditions in the French Alps in 1700. The geographical value of archival documents is specifically illustrated in the paper "Le Haut Dauphiné à la fin du xvii^e siècle" by Professor Raoul Blanchard (*Recueil des Trav. de l'Inst. de Géogr. Alpine*, Vol. 3, 1915, No. 4, Grenoble). The documents in question pertain to the last of a long series of processes of reassessment for taxation (*procès-verbaux de la révision des feux de 1700*). They comprehend three classes of material of unequal value for geographic interpretation—the remonstrances of the assessed communities, their responses to the formal questions of the assessment, and the reports of the assessment commissions. The communities naturally exaggerated the adverse circumstances of their situation. The importance of climate they fully recognized. To its wretched character they attributed a major portion of their woe. But the statements of neighboring communes are inconsistent, and all are at variance with the nature of the agricultural life revealed in the responses and reports. These demand a climate not very different from that of today. The distribution of such critical plants as the olive, almond, and walnut is identical with that of the present. The vine and the principal cereals were indeed more widely cultivated, for in those days of limited transportation specialization was little known, communities were largely self-supporting. Pastoral industry, too, was entirely subordinate.

Metecrological data, of course, are lacking but, assuming the small cyclic variations that appear in the observations continued over a 125-year period in neighboring Savoy (Ancey), the end of the seventeenth century should have been under favorable temperature conditions. This is confirmed by the contemporaneous state of the glaciers of Savoy. The facts of emigration were likewise adduced by the inhabitants as a proof of general distress. Yet the phenomenon of emigration was then as now an apparently normal response to the mountain environment. Chiefly temporary and seasonal in character, it only attained considerable dimensions at the higher elevations. Altitude and emigration were in close agreement. The movement, for instance, was unknown in the pleasant valley of Grésivaudan. In the mountains, where the chief cereals were only harvested once in two years—the grain takes thirteen months to mature—and where winter industries did not obtain, the peasant solved the question of subsistence by migration for five, six, or seven months of the year. The emigration had no specific objective. It penetrated all France and led the mountaineer into a variety of work, chiefly of laborious and inferior nature. The men who were absent for the longest period of time devoted themselves most largely to petty commerce—peddling. Apart from religious and other exceptional causes the attraction of this lucrative business was perhaps mainly responsible for a certain percentage of population being drawn permanently away from the mountains.

The assessment figures unfortunately do not permit of an entirely satisfactory estimate of the population of the time. They give the number of "hearths" but no clue to a transforming factor. For a study of comparative distribution the empirical figure 4.5 may be taken as the factor for transforming the family unit into individuals. The results so obtained are what might be anticipated. The towns and valleys have gained in population since 1700, the high mountains have lost.

Improvements in Internal Communication to the Port of Marseilles. The opening, on May 7, of the Marseilles-Rhône canal will make possible direct communication between Lyons and Marseilles for the considerable barge traffic plying on the Rhône between these two centers. A unique feature is a tunnel carrying the canal through a ridge which cuts off Marseilles from the interior (Perceement du Tunnel de Rove, *La Nature*, March 4, 1916). The tunnel is remarkable for its size and length. It is 72 feet wide and 10 feet deep and is cut through the Chaîne de la Nerthe a distance of four and a half miles. Land communication has also been improved by the construction of a new railroad line paralleling the coast westward from Marseilles to the north shore of the outlet of the Berre lagoon and thus connecting with the line to Arles (La nouvelle ligne ferrée de l'Estaque à Miramas (Marseille-Arles), *La Nature*, Feb. 12, 1916). The new line, besides facilitating the transport of troops and merchandise, will assure continuance of communication in the event of a block on the main line to Paris. Although such an accident does not appear probable, it must be borne in mind that the Paris-Mediterranean line pierces the Chaîne de la Nerthe by a tunnel nearly three miles long and that the former sole alternative road, the line through Aix, suffers from the disadvantages of single track and steep gradients.

A Geographical Commission for Russian Poland. The German government has organized a "landeskundliche Kommission" for the study of the geography of Poland (*Geogr. Zeitschr.*, Feb., 1916). The area of investigation is practically that of the Kingdom of Poland as defined by the Congress of Vienna in 1815, or the Vistula provinces of Russian designation. The commission intends to publish a geographical handbook of Poland, based on the available literature and on the field investigations of its members. A series of detailed regional studies will also be published. The subjects represented by the members of the scientific staff, of which Dr. Max Friederichsen, professor of geography at the University of Greifswald, is director, are: structural and historical geology, glacial geology, geophysics, meteorology, and ethnology. In addition, several members of the civil administration will study the economic and commercial geography of the region, and the staff of the military meteorological service of the eastern front will contribute an account of the climatology.

Bulgarian and Turkish Mineral Resources. The participation of Bulgaria and Turkey in the war on the side of the Central Powers was welcomed in Germany on the ground of substantial economic advantages. The mineral resources of the two countries (Turkey is here practically synonymous with Asia Minor) are discussed in an article by Dr. Paul Krusch, of the Prussian Geological Survey, in the *Berliner Tageblatt's* weekly edition of December 29, 1915. According to this authority coal of all grades occurs both in Bulgaria and Turkey. In Bulgaria anthracite is found in the Balkan Range near Shipka Pass along the contact between the old eruptives and the limestones.

This form of coal is rare in Turkey. Both countries teem, however, with lignite beds. In Bulgaria they occur in the Cretaceous foreland between the Balkan Range and the Danube, in the central part of the Balkan Range itself, and in the Tertiary lacustrine deposits of intermont basins west of Sofia. In Turkey they are of widespread occurrence.

Iron, although known both in Bulgaria and Turkey, has not been worked extensively in either country. Explorations conducted on the site of reported discoveries appear to have yielded no startling results. Turkey is perhaps better favored as regards quantity, although its transportation facilities are totally inadequate for the handling of large tonnages. The importance of the countries as copper producers is greater, especially in the case of Turkey. Bulgaria's yield amounted to 1,650 tons of copper in 1911. Turkey's annual production of this metal attains approximately the same figure. The existence of a rich copper belt along the eastern shore of the Black Sea as well as in the basin of the upper Tigris is suspected. Both of these regions are thickly studded with ancient workings. The deposits of the Tigris region have been worked in a desultory fashion since the eleventh century.

Lead and zinc are not abundant in Bulgaria, but occur in Asia Minor in large deposits along the contact between the Tertiary eruptives and Carboniferous limestones. In general it may be said that of the two countries Turkey is by far the richer in mineral wealth. It is extremely doubtful, however, whether the Teutonic powers will be able to derive any advantage from this fact in the present war. Most of the Bulgarian and Turkish deposits require at least two years' development and the expenditure of adequate capital before being made to yield their treasures. Appreciable quantities cannot therefore be mined before the end of 1917, provided the work was started last fall. The gradual passing of Turkish territory into Russian hands will likewise prevent shipments of Turkish ore from reaching German or Austrian localities of consumption.

ASIA

The Turks in Asia. An echo of Constantinople "Panturkists" is found in an article by Professor Eugen Oberhummer of the University of Vienna in the *Geographische Zeitschrift* for February (Die Türken und das osmanische Reich, Vol. 22, 1916, pp. 52-87). According to this authority the number of Turks scattered over the vast Asiatic steppeland amounts to about 28,000,000. From the peninsula of Anatolia to western China a traveler speaking Turkish and proceeding north of the central mountain belt of Asia can generally make himself intelligible to the Tatar nomads on his path. Approximately 8,000,000 of these Turks dwell within Turkish official limits. The largest body—some 15,000,000—is found on Russian territory. Persia harbors 2,000,000. Approximately the same number reside in Khiva and Bokhara, while fully 1,000,000 live in China. All these Turks or Tatars speak the same form of Uralo-Altaic language. In Persia and Turkey the admixture of Arabian and Persian words in their language is large. North and east of Persia, however, the language flourishes in its primitive simplicity, free from foreign intrusions. It is interesting to note that in Turkey, where Turks are endeavoring to create feeling in favor of the union of Turkish-speaking peoples, the total number of Turks is placed at between 60,000,000 and 70,000,000. These excessive figures are obtained by including every tribe of Uralo-Altaic speech, practically all the Siberians, and the Mongols or kindred groups.

Racially the Turks belong to the broadheaded type of Central-Asian mobile peoples and are believed to be descended from the Mongols. The original type has disappeared in the course of their westerly expansion, owing to excessive intermixing with alien peoples. This can be seen today in Turkey, where the so-called Turk presents no physical difference from the conquered Christian populations. Indeed it is a characteristic of the Turk to resemble in appearance the peoples among whom he has settled. Thus the Turks of Armenia resemble Armenians, while on the Ionian coast they differ but slightly from the Greeks. But between the true Turk who has managed to preserve his Central-Asian individuality and the Tatar no difference can be found in language or race. The Turk of western Asia is the Tatar of central Asia or the Mongol of eastern Asia, to whom he is known as Ta-ta. The transition from the oblique to the normal eye as one proceeds westward from the Mongol's territory to the Anatolian tableland of the Turk is observable among the Tatars. As in eastern Europe the Turk is an intruder in western Asia.

Irrigation in the Punjab. The opening last December of the Upper Jhelum Canal completes the Punjab Triple Canal Project within the short time of ten years. It is estimated that the scheme will add not far short of two million acres of productive land to this already vastly important granary of the British Empire. According to the latest

official returns (Agricultural Statistics of India, 1912-1913, Vol. I, Calcutta, 1915) about 11,500,000 acres—half the total cultivated area—are dependent on irrigation, one-third from wells, two-thirds from the Government canals. Of this area 4,500,000 acres are under wheat. Irrigation thus accounts for rather more than half the total wheat acreage of the entire province, but the production from the irrigated lands is greatly superior; the ratio of yield for irrigated and non-irrigated being about 9:5.5. Specific references to the areas irrigated by the canals may be found in *Nature* (No. 2415, Vol. 96, 1916) and *United Empire* (N. S., Vol. 7, 1916, No. 2).

Operations of the Survey of India. The last report issued by the Survey of India covers operations undertaken from October 1, 1913, to September 30, 1914. Among the notable events of the period mention is made of the return of Captains Bailey and Morshead from six months' exploration in the eastern Himalayas. The work of both officers added greatly to our geographical knowledge of this region, besides clearing up all doubts as to the course of the Tsan-po, or Brahmaputra River (see "The Identity of the Sanpo and Dihang Rivers," *Bull. Amer. Geogr. Soc.*, Vol. 47, 1915, pp. 259-264.) The success of experiments to determine accurate differential longitudes by wireless telegraphy across the highest mountain ranges is also reported. These tests were conducted in the course of De Filippi's expedition to the Karakoram and in co-operation with the Survey's observatory at Dehra Dun. Differential longitudes between this station and points on the upper reaches of the Indus as far as Leh, on both sides of the Karakoram Pass, and in Chinese Turkestan were determined by the simultaneous recording of wireless telegraphic signals sent out by the Lahore radio office combined with astronomical observations. Additional exploration was carried on the North-East Frontier by Lieutenant Huddleston. This officer accompanied a mission into the Aka country lying west of the country of the Abors and succeeded in making a reconnaissance survey of an area about 4,000 square miles in extent. This brings the total area surveyed since 1911 in the North-East Frontier Territory to about 49,000 square miles.

Siberian Traffic Problems. Although the traffic congestion at the port of Vladivostok is reported to be considerably relieved, private merchandise is still apt to suffer delay in transit, for 75 per cent of the available railroad freight space is reserved for Government use (*Commerce Repts.*, No. 67, Washington, 1916). A certain measure of relief is anticipated with the opening up of the navigation season on the Amur River, an event timed for the middle of June. The route thus available extends up the river for some 2,000 miles from Nikolayevsk at its mouth to Sryetensk on its left headwater branch, the Shilka, at the head of navigation for larger craft. Sryetensk is connected by a branch line with the main Trans-Siberian Railway and also with the Amur Railway. The latter, which is to provide an all-Russian rail route to the Pacific (the eastern end of the Trans-Siberian crosses Chinese territory), parallels the Amur on the north at some distance from the river as far as Khabarovsk, where rail connection with Vladivostok exists. Construction on the Amur Railway was begun in 1908 and has to date progressed as far as Blagovyeshchensk, a distance amounting to about 60 per cent of the total line to be built (Baedeker's Russia, 1914 edit., p. 539 and map facing p. 497). The traffic problems of the Siberian ports are closely related to those of our own Pacific ports. In this connection it is interesting to note that a new shipping agency has been established in Seattle operating a fleet of eight vessels chartered to sail between Puget Sound and Vladivostok (*Commerce Repts.*, No. 32, Washington, 1916).

WORLD AS A WHOLE AND LARGER PARTS

Early Hispano-Japanese Relations. A valuable bibliography of early Portuguese and Spanish contact with Japan by James A. Robertson is contained in the February, 1915, issue of the *Transactions of the Asiatic Society of Japan*. This intercourse centers chiefly around the great missionary movements which originated in the Iberian peninsula after the discovery of America. At the same time, the main purpose of Portuguese as of Spanish overseas activity was commercial.

In the middle of the sixteenth century, shortly after the accidental discovery of Japan by the Portuguese, there appeared to be reason to believe that Christianity was destined to spread rapidly in the islands. The Japanese *daimios* manifested eagerness to establish close trade relations with the west and made great show of friendliness towards Portuguese Jesuits and Spanish friars. The revulsion in feeling which took place at the end of the same century was due to the intolerance of the Christian missionaries no less than to a dawning conviction among the Japanese that the missionaries were merely disguised agents engaged in paving the way for the ultimate conquest of the land by

western sovereigns. The friendly relations which had marked the beginning of Hispano-Japanese intercourse gave place to ruthless persecution of Christian communities of converts by the islanders.

Considerable commercial rivalry also appears to have existed between the Japanese and the Spaniards with regard to the Philippine trade. Japanese junks found their way to the islands and carried traders who settled in Manila and other points to carry on their business. This apparently did not suit the Spaniards, and there was little mutual understanding between them and their eastern competitors.

HUMAN GEOGRAPHY

Man's Influence Upon the Earth. In the study of the reciprocal relations of man and earth the emphasis is placed rightly on the physical environment as affecting the activities of man. The effects of man on the earth, although universally recognized, have received but occasional systematic attention. The geologic texts of Lyell, Dana, and Chamberlin and Salisbury make brief mention of man as a physiographic and geologic agent. Recent suggestive articles on this topic have been written by A. Woeikof (*De l'influence de l'homme sur la terre, Ann. de Géogr.*, Vol. 10, 1901, pp. 97-114 and 193-215); C. P. Lucas (*Man as a Geographical Agency, Geogr. Journ.*, Vol. 44, 1914, pp. 479-492); and, most recently and most exhaustively, by Ernst Fischer (*Der Mensch als geologischer Faktor, Zeitschr. der Deutschen Geol. Gesell.: A. Abhandl.*, Vol. 67, 1915, pp. 106-148, listed in the *Feb. Review*, p. 168).

Fischer points out the fact that man is at present one of the leading agents in the direct modification of the earth's surface. He estimates the mass of material moved annually in the production of ores, mineral fuels, and salt at one cubic kilometer and would possibly double this figure for all mineral industry. To this amount are to be added the vast quantities of earth and rock moved in building and agricultural operations. Even more important is man's release or stimulation of physiographic forces, there being in general a great disproportion between the forces released and the energy expended by man in disturbing their equilibrium. The control of streams, the reduction of lake and swamp areas, the increased run-off, the decreased cover of vegetation, and, more especially, the rapid exploitation of the great ground-water reservoir represent, in the opinion of the author, the most extensive interference by man with the physiographic processes. The influence of man, as that of the other surficial agencies, is dominantly degradational, with occasional and minor aggradational activities.

Man is an important ecological factor, in other words, is modifying profoundly the paleontological record of the future. The adjustment of plant associations is being disturbed by the introduction of new species, by the clearing and cultivation of land, by fire, and other means resulting from the voluntary or involuntary meddling of man. Similar revolutionary changes are wrought in the animal world, especially among the larger animals and among numerous parasitic forms.

By his distribution through all climatic regions and his power to employ great physical forces man has become the guide fossil of the present geologic period. A consciousness of this geologic role of man is necessary for the continued well-being of future generations. Conservation therefore becomes a problem of geology, as well as geography.

CARL O. SAUER.

Blackwater Fever and a Specific for It. Wide publicity should be given the offer of Carlotta J. Maury (*Science*, March 10, 1916, p. 349) to submit for expert study a specimen of a plant from the interior of Venezuela which is used by the natives as a specific for the dreaded blackwater fever. Tropical lands not only present great climatic difficulties to the colonizer but also a number of unconquered diseases. Moreover the tropical lands of the western hemisphere are but thinly peopled in spite of great natural wealth. The lack of an adequate labor supply is the chief drawback to the exploitation of both soils and forests. When endemic diseases are conquered or measurably suppressed the present populations will be conserved and new or colonizing populations attracted. Every fact even suggesting a discovery in the field of tropical medicine should be thoroughly investigated. As soon as three or four unfilled temperate regions of the world are occupied the comparatively empty tropical lands of America will have a high potential value to the white race.

GEOGRAPHICAL NEWS

An American Historical Atlas. Satisfactory progress is reported on the proposed Atlas of the Historical Geography of the United States undertaken by the Department of Historical Research of the Carnegie Institution of Washington (*Year Book for 1915*,

pp. 177-178). The letterpress by Dr. Charles O. Paullin is in a fair way of completion, and maps in suitable form for execution by photolithography have been prepared from his sketches. The history of presidential elections will thus be cartographically illustrated.

Other sections of the work are also nearing achievement. A general physical map has been prepared by Professor R. H. Whitbeck of the University of Wisconsin, which is to be used as a base in the representation of economic features during various periods of American history. A chart showing oceanographic data related to American history has likewise been prepared by G. W. Littlehales of the Hydrographic Office.

Retirement of Professor Richard Elwood Dodge. Professor Richard Elwood Dodge, after twenty years' service as teacher of geography in Teachers College, Columbia University, has resigned his professorship, to devote himself uninterruptedly to those aspects of geography that interest him most, applied geography in the field of rural and especially agricultural education. Professor Dodge has gained a high place in educational geography. As the author of the "Dodge Geographies" and allied series, he has probably done more than any other man in the country in improving geographic education in elementary and particularly rural schools. We are too slow in this country in recognizing the value of this type of work as distinguished from "research." We must have research, but the fruits of research are withheld from the public unless the great memoirs are translated into common language. The geography of the average citizen is obtained from his grammar school text, not from memoirs which he almost never sees, much less reads.

It is a pleasure to announce at this time that Professor Dodge has been again appointed Editor of the *Annals of the Association of American Geographers*, a position which he held from 1911 to 1915. To this work he brings unusual experience. In 1897 he founded and edited the *Journal of School Geography*, which later became the *Journal of Geography*. In a list of the contributors to that journal would be found the names of most of the American geographers of the time; and the volumes contain a large body of geographic material that has permanent value.

PERSONAL

MRS. HARRIET CHALMERS ADAMS gave an illustrated lecture on Spain before the Geographical Society of Philadelphia on May 3.

PROF. CHARLES P. BERKEY, of the department of geology of Columbia University, outlined the plans of the New York Academy of Sciences for field work in Porto Rico during 1916 before the Academy on May 15.

PROF. ELIOT BLACKWELDER, of the department of geology of the University of Wisconsin, has been appointed professor of geology and head of the department at the University of Illinois. The appointment will take effect on September 1.

MR. C. E. P. BROOKS read a paper on February 16 before the Royal Meteorological Society of London on "The Rainfall of Nigeria and the Gold Coast." The paper dealt with the rainfall on the Guinea Coast and its hinterland for the ten years 1904-13.

PRESIDENT NICHOLAS MURRAY BUTLER of Columbia University, in his address on national unity before the Associated Press on April 25, touched upon geographic influences as illustrated by the tendency of a people to make its national domain coextensive with a well-defined natural unit. He is quoted as saying:

"A nation is scientifically defined as a population of an ethnic unity inhabiting a geographic unity under a common form of government. The exceptions are quite numerous enough to prove this rule. As the centuries have followed one another it is not difficult to see how the several nations have endeavored to possess themselves of territory that is a geographic unit. They have sought natural boundaries, whether of high mountains, or of broad rivers, or of the sea itself. One war after another is to be explained in terms of a nation's definite purpose to possess itself of a geographic unity as its home. There has been by no means equal care taken by the nations to establish and to protect an ethnic unity."

PROF. HENRY E. CRAMPTON, of Barnard College and the American Museum of Natural History, gave an illustrated lecture on "Kaïeteur and Roraima: The Great Falls and the Great Mountain of Guiana" before the Appalachian Mountain Club of Boston on February 4.

MR. W. C. CRANDALL, master of the *Alexander Agassiz*, the sea-going scientific col-

lecting vessel of the Scripps Institution for Biological Research at La Jolla, near San Diego, Cal., will give a course on "Local Coastal Physical Geography" at the "summer assembly in science" of the institution, which will be held from June 25 to August 15.

DR. CLIFFORD H. FARR spoke on "Jamaica and Its Plants" before the Torrey Botanical Club on May 9.

DR. CRISTOBAL HICKEN read a paper on January 22 at the annual meeting of the Society of American Foresters in Washington, D. C., on "Vegetation Zones of Argentina and Adjoining Regions."

MR. E. T. HODGE spoke on May 15 before the New York Academy of Sciences on the "Geology of the Coamo-Guayama Region, Porto Rico."

MR. J. W. JACKSON spoke on February 8 before the Literary and Philosophical Society of Manchester, England, on "The Geographical Distribution of the Shell-Purple Industry." The paper dealt with the production of purple dye by the Phoenicians and its spread to eastern Asia and Central America.

PROF. DOUGLAS W. JOHNSON of Columbia University addressed the members of the Geographical Society of Philadelphia on "Geographical Features of the Russian Retreat" at their annual luncheon on April 29. At the request of Major-General Leonard Wood, Professor Johnson will discuss the influence of topography on the European war at the military camps at Plattsburg during the coming summer.

SIR DOUGLAS MAWSON sailed on May 2 from New York for England on the *S.S. Orduna*. He had arrived from Australia the day before and was on his way to London to take up duties assigned to him in the War Office.

DR. GEORGE E. NICHOLS, assistant professor of botany in Yale University, gave an illustrated lecture on April 15 before the Biological Club of Mount Holyoke College on the "Plant Societies of Connecticut."

DR. ERLAND NORDENSKIÖLD'S collection of ethnographical specimens, made on his recent expedition in the boundary districts of Bolivia and Brazil, referred to in the *April Review* (p. 308), have safely reached the museum in Göteborg. For a time fears were entertained as to their safety, as it was thought they might have been lost when the German cruiser *Karlsruhe* sank (*Zeitschr. für Ethnologie*, 1915, No. 4-5, pp. 322-323).

MR. W. J. PERRY spoke on February 8 before the Literary and Philosophical Society of Manchester, England, on "The Geographical Distribution of Terraced Cultivation and Irrigation."

MR. D. R. SEMMES spoke on May 15 before the New York Academy of Sciences on the "Geology of the San Juan District, Porto Rico."

SIR NAPIER SHAW presented a paper before the Royal Meteorological Society of London on March 15 on "The Meteorology of the Globe in 1911." The paper dealt with the material in the first of a series of annual meteorological summaries for the world about to be published by the London Meteorological Office. The volume for 1911 will give, besides other information, particulars of pressure, temperature, and rainfall for available stations in all parts of the globe at the rate of two stations for each ten-degree square.

DR. J. R. SUTTON read a paper on February 16 before the Royal Meteorological Society of London on "South African Coast Temperatures." This paper dealt with the normal monthly mean temperatures at selected stations on the coast of South Africa, a few miles inland, and on the tableland.

DR. ERICH WUNDERLICH, assistant in the department of geography at the University of Berlin and one of the junior members of the Society's Transcontinental Excursion of 1912, has been appointed geographer to the "Landeskundliche Kommission" organized by the German government for the study of Russian Poland, to which reference is made on page 459. Doctor Wunderlich will devote himself especially to the glacial geology of the region.

OBITUARY

DR. CHARLES A. DAVIS died on April 9, aged 55. He was widely known as a peat expert. In this capacity he served the U. S. Geological Survey from 1907 to 1910 and the Bureau of Mines from 1910 to 1912, at which date his title was changed to fuel technologist. Davis' two most important contributions to the subject are: "Peat: Essays